

WHAT IS CLAIMED IS:

1. An isolated nucleic acid sequence encoding a motor protein, wherein the motor protein has the following properties: (i) the protein's activity includes microtubule stimulated ATPase activity; and (ii) the protein has a sequence that has greater than 75% amino acid sequence identity to SEQ ID NO:2, SEQ ID NO:4, SEQ ID NO:6, or SEQ ID NO:8 as measured using a sequence comparison algorithm.
2. An isolated nucleic acid sequence of Claim 2, wherein the nucleic acid encodes SEQ ID NO:2, SEQ ID NO:4, SEQ ID NO:6, or SEQ ID NO:8.
3. An isolated nucleic acid comprising a sequence which has greater than 75% sequence identity to SEQ ID NO:1, SEQ ID NO:3, SEQ ID NO:5, or SEQ ID NO:7 as measured using a sequence comparison algorithm.
4. An isolated nucleic acid sequence of Claim 3, wherein the nucleic acid has a nucleotide sequence of SEQ ID NO:1, SEQ ID NO:3, SEQ ID NO:5, or SEQ ID NO:7.
5. An isolated microtubule motor protein, wherein the protein has greater than 75% amino acid sequence identity to SEQ ID NO:2, SEQ ID NO:4, SEQ ID NO:6, or SEQ ID NO:8 as measured using a sequence comparison algorithm.
6. An isolated protein of Claim 5, wherein the protein has an amino acid sequence of SEQ ID NO:2, SEQ ID NO:4, SEQ ID NO:6, or SEQ ID NO:8.
7. A method of identifying a candidate agent as a modulator of function of a target protein wherein said target protein comprises Kid, or a fragment thereof and said method comprises:

- a) adding a candidate agent to a mixture comprising a target protein that directly or indirectly produces ADP or phosphate under conditions which normally allow the production of ADP or phosphate;
- b) subjecting the mixture to a reaction that uses said ADP or phosphate as a substrate under conditions which normally allow the ADP or phosphate to be utilized; and
- c) determining the level of activity of the a reaction wherein a change in said level between the presence and absence of said candidate agent indicates a modulator of said target protein function.

8. The method of Claim 7, wherein said determining occurs by a fluorescent, luminescent, radioactive, or absorbance readout.

9. The method of Claim 7, wherein said level of activity of said reaction is determined at multiple time points.

10. The method of Claim 7, wherein a plurality of candidate agents are added.

11. The method of Claim 7, wherein said target protein directly produces phosphate or ADP.

12. The method of Claim 7, wherein said target protein comprises an amino acid sequence which has greater than 70% sequence identity with SEQ ID NO:2, SEQ ID NO:4, SEQ ID NO:6, or SEQ ID NO:8.

13. A method of treating cellular proliferative diseases comprising administering a candidate agent identified by the method of Claim 7.

14. A method according to Claim 13 wherein said disease or disorder is chosen from the group consisting of cancer, hyperplasia, restenosis, cardiac hypertrophy, immune disorders and inflammation.

15. A method of inhibiting a target protein wherein the target protein comprises KID or a fragment thereof, said method comprising contacting the target protein with a candidate agent identified by the method of Claim 7.

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